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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Henri Arnold De Bruyn

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EXAMINER

SLAWSKI, MAGALI P

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/501,356	DE BRUYN ET AL.	
	Examiner	Art Unit	
	Magali P. Slawski	1728	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2012.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☒ Claim(s) 1,2,4,6,8-14,16-20,40,41,43,45,47-57,64-69,71-73,75-78,80 and 81 is/are pending in the application.
- 5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 1,2,4,6,8-14,16-20,40,41,43,45,47-57,64-69,71-73,75-78,80 and 81 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

Continuation of Disposition of Claims: Claims pending in the application are 1,2,4,6,8-14,16-20,40,41,43,45,47-57,64-69,71-73,75-78,80 and 81.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 23, 2012 has been entered.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

Claims 1-2, 6, 8-9, 12-14, 16-20, 40-41, 45, 47-48, 52-56, 57 and 66-68 are rejected under 35 U.S.C. 103(a) as being unpatentable over **de Bruyn** (WO 00/40669) in view of Terentiev et al. (US 4,597,928), henceforth **Terentiev**.

Regarding **claims 1, 6, 40, 45** and **68** de Bruyn discloses mixing a polar solvent (water, 5:19-21), a urea formaldehyde precondensate (1:11-14, 2:1-2), additional urea (1:15-16) and an acid (citric acid, 3:8-10), mixing resulting the binder composition with soil and allowing the binder to set (7:11-12). As de Bruyn shows in Example 3 (10:22 - p 11-16), the binder's setting time is inherently determined by the end pH. Of two binder compositions that vary only in their acidity, the more acidic "third mixture," with an end pH of 3.85, sets in 65 minutes (11:5-7, 10-11), in contrast to the more basic "second mixture" which has a pH of 5.45 and sets in 1400 minutes (11:3-4, 9-10).

De Bruyn does not explicitly teach adjusting the binder's pH. However, de Bruyn teaches that the binder's end pH is "most preferably between 3.5 and 5" (4:5-6), well within the range of 2.0 to 5.3 recited by the claim. Since de Bruyn states a preference of pH in this range, it would have been obvious to one of ordinary skill in the art to adjust the pH to a value within that range.

De Bruyn does not teach using a complex fatty acid derived from the oxidation of vegetable sugars as a binding promoter. However, de Bruyn teaches adding sulfuric acid as an catalyst (3:8-10) to facilitate polymerization, thereby solidifying or hardening the resin (3:27-29). Terentiev, whose invention is drawn to binding particles (wood chips, 1:58-69, and peat fibers, 3:43-44) in a formaldehyde-based resin (2:14 and 3:49-50), teaches that fulvic acid makes an effective substitute for sulfuric acid as a hardener (3:59-63). Therefore, it would have been obvious to one of ordinary skill in the art to substitute fulvic acid for the sulfuric acid taught by de Bruyn in order to achieve predictable results with a reasonable expectation of success.

Regarding **claims 2** and **41**, de Bruyn teaches that the polar solvent is water (5:19-21).

Regarding **claims 8-9** and **47-48**, de Bruyn teaches mixing in an anionic bitumen emulsion prior to setting (5:7-8, 15:7-8, 20-21).

Regarding **claim 12**, de Bruyn teaches adding silicones, silanes, oils, anti-corrosion agents, ultraviolet light blocking agents, biocides, pH buffers, cement, ammonia, ammonium salts, plasticizers (4:9-13) or phenols (4:18) to the binding mixture before setting.

Regarding **claims 13** and **52**, de Bruyn teaches that the plasticizers may be phthalates, hydrocarbons, acetates or glycols (4:15-16).

Regarding **claims 14** and **53**, de Bruyn teaches that the ultraviolet light blocking agents may be organic phenols, phosphates or inorganic oxides (4:18-19).

Regarding **claims 16-17** and **54-55**, de Bruyn teaches that the end molar ratio of formaldehyde to urea in the binder is "between 3:1 and 1:1, and most preferably between 2:1 and 1:1" (2:13-16). These ranges cover that cited by the claim, 1.5:1 to 2.5:1.

Regarding **claim 18**, de Bruyn teaches that aggregate matrix maybe compacted into a mold before setting (7:5).

Regarding **claims 19-20** and **56-57**, de Bruyn teaches that the acid is citric acid (3:8).

Regarding **claim 66**, de Bruyn teaches making roads, walls, floors, foundations, ponds, dams, tanks, canals, embankments, railway lines, tunnels, pylons, poles, pipes, landing strips, grouting, sports fields, artificial rocks, statues, and decorative stones (7:15-25). De Bruyn also teaches making bricks (7:5).

Regarding **claim 67**, de Bruyn does not teach using humic acid. However, de Bruyn teaches adding sulfuric acid as an catalyst (3:8-10) to facilitate polymerization, thereby solidifying or hardening the resin (3:27-29). Terentiev, whose invention is drawn to binding particles (wood chips, 1:58-69, and peat fibers, 3:43-44) in a formaldehyde-based resin (2:14 and 3:49-50), teaches that humic acid combined with fulvic acid makes an effective substitute for sulfuric acid as a hardener (3:59-63).

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Therefore, it would have been obvious to one of ordinary skill in the art to substitute fulvic acid plus humic acid for the sulfuric acid taught by de Bruyn in order to achieve predictable results with a reasonable expectation of success.

Regarding *when* the humic acid is added, the selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results. Cf. MPEP 2144.04 IIC. Furthermore, the selection of any order of combining ingredients is prima facie obvious. Cf. MPEP 2144.04 IIC.

Regarding **claims 70, 74 and 79**, de Bruyn teaches using SS60 (15:8), which, according to Applicant's Exhibit A filed May 12, 2011, is a slow set anionic bitumen emulsion.

Regarding **claims 71 and 75**, de Bruyn teaches using the anionic bitumen emulsion in a quantity between 1 % and 5 % by mass of the soil in the mixture (5:17-18).

Regarding **claims 72, 76 and 80**, the rationale for using fulvic acid is provided in the rejection of claim 1. Given that Applicant has not defined a structural or functional difference between synthetic and non-synthetic fulvic acid, it would have been obvious to one of ordinary skill in the art to use either in the place of the other depending on which was more consistently available and cheaper at the time.

Regarding **claims 73, 77-78 and 81**, de Bruyn teaches mixing in an anionic bitumen emulsion prior to setting (5:7-8, 15:7-8, 20-21).

Claims 10-11 and 49-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over **de Bruyn** in view of **Terentiev** as applied to claims 1 and 40 above, and further in view of **Prather** (US 4,376,088).

Regarding **claims 10-11** and **49-50**, de Bruyn does not teach mixing in a surfactant as a binding promoter. However, Prather teaches adding the dodecylbenzene sulfonic acid (2:5, 7:49,:59) to a binder composition (1:64-68) to promote uniform binding by disperse the binding agent in an aqueous solution (5:17-26) and later to facilitate separation of the shaped article and the shaping means (1:46-51). Therefore it would have been obvious to one of ordinary skill in the art to mix in dodecylbenzene to the binder taught by de Bruyn because Prather teaches using dodecylbenzene sulfonic acid both to as a surfactant and as a release agent. *Alternatively*, it would have been obvious to one of ordinary skill in the art to combine the use of dodecylbenzene sulfonic acid with the steps taught by de Bruyn to achieve predictable results with a reasonable expectation of success.

Claims 4, 43, and 64-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over **de Bruyn** in view of **Terentiev** as applied to claims 1 and 40 above, and further in view of in view of Markessini et al. (US 4,886,854), henceforth **Markessini**.

Regarding **claims 4, 43, 64-65** and **69** De Bruyn does not teach including a sugar in the binder composition. However, Markessini teaches combining glucose, fructose, sucrose or a mixture thereof (2:60-64) with a urea and formaldehyde (2:9-11)

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to make a binding composition that is safer for the environment and for workers than resin (1:13-19). Therefore it would have been obvious to one of ordinary skill in the art to add glucose, fructose, sucrose or a mixture thereof to the urea-formaldehyde binder taught by de Bruyn because Markessini teaches this combination as a safe and effective substitute for resin. *Alternatively*, it would have been obvious to one of ordinary skill in the art to combine the use of glucose, fructose, sucrose or a mixture thereof with the steps taught by de Bruyn to achieve predictable results with a reasonable expectation of success.

Claim 67 is rejected under 35 U.S.C. 103(a) as being unpatentable over de Bruyn in view of Terentiev as applied to claim 1 above, and further in view of Terpstra et al. (US 5,523,049), henceforth **Terpstra**.

Regarding **claim 67**, de Bruyn does not teach using humic acid. However, Terpstra teaches adding humic acid to a urea-formaldehyde binder to "achieve higher loading of the powder particles in the binder" (4:22-29). Therefore it would have been obvious to one of ordinary skill in the art to add humic acid to the binder taught by de Bruyn because Terpstra teaches that humic acid helps integrate the particles with the binder. *Alternatively*, it would have been obvious to one of ordinary skill in the art to combine the use of humic acid with the steps taught by de Bruyn to achieve predictable results with a reasonable expectation of success.

Regarding *when* the humic acid is added, the selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected

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results. Cf. MPEP 2144.04 IIC. Furthermore, the selection of any order of combining ingredients is prima facie obvious. Cf. MPEP 2144.04 IIC.

Response to Arguments

Applicant's arguments filed July 23, 2012 have been fully considered but they are not persuasive.

Citing the Declaration filed May 12, 2012, Applicant argues because Terentiev's invention is not directed to road construction, it would not have been obvious to one of ordinary skill in the art to combine Terentiev's teachings with de Bruyn's. The examiner respectfully disagrees. De Bruyn and Terentiev are related because both are using a formaldehyde-based thermosetting resin to bind particles into a moldable mass. De Bruyn's particles are soil particles while Terentiev's are wood chips, but the principle is the same. Both references use sulfuric acid to control the pH and thereby accelerate curing. The operation is similar and the task of curing is the same; sulfuric acid functions similarly in each reference. Therefore the combination of their teachings and the substitution of fulvic acid for sulfuric acid would have been obvious to one of ordinary skill in the art.

Referring to the Declaration filed May 12, 2012, Applicant argues that the road material of the instant application "would not achieve the same acidity as sulfuric acid on a mole-to-mole basis" (page 11 paragraph 2). In response to Applicant's argument, a slight difference in the acidity achieved by fulvic acid versus sulfuric acid does not make the proposed substitution any less obvious. First, the proposed substitution is of

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humic acid plus fulvic acid, not fulvic acid alone. Second, if there is a difference between the effects of fulvic-plus-humic acid versus sulfuric acid, Applicant has not yet provided evidence that the difference would be either significant or detrimental to the process or product.

Applicant argues the combination of fulvic acid and soil produces an unexpected result. The examiner is interpreting this statement to mean that fulvic acid unexpectedly produced results that were significantly better than those produced by sulfuric acid. If this is the case, then Applicant is encouraged to file evidence to demonstrate that difference and thereby establish the criticality of the fulvic acid. For example, if Applicant has data comparing the polymerization rates and crosslinking of fulvic acid versus sulfuric acid, providing that data could help to distinguish the claimed invention from the prior art.

Applicant also argues that the examiner has not considered the advantages of adding an anionic bitumen emulsion prior to the mixture's setting. In response to Applicant's argument, though this result of combining the anionic bitumen with resin may not have been appreciated, de Bruyn *teaches* the claimed step of adding the anionic bitumen before setting. Therefore combination of references would inherently yield the same advantages achieved by Applicant and if they do not, it must be due to some limitation not currently claimed. A new property of an obvious combination does not confer patentability to the claim in the absence of a showing of criticality or unexpected results that are commensurate with the limitations of the claim. The claims at hand are drawn to a method, not to the results.

This application is in its fourth year of prosecution. If Applicant believes that a live discussion would be helpful in clarifying issues and advancing prosecution, the examiner would welcome a request for an interview.

Conclusion

With the exception of cancelled claims 70, 74 and 79, the instant claims are the exact same claims as filed May 12, 2011. The instant rejection is the exact same rejection as mailed June 22, 2011, minus the rejections of the cancelled claims. Therefore, the grounds of rejection are exactly the same as in the previous rejection. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action in this case. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no, however, event will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Magali P. Slawski whose telephone number is (571)270-3960. The examiner can normally be reached on Monday through Friday, 9 a.m. to 5 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer K. Michener can be reached on (571) 272-1424. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Magali P. Slawski/
Examiner, Art Unit 1728

/Jennifer K. Michener/

Supervisory Patent Examiner, Art Unit 1728